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# Gamburtsev Subglacial Mountains: Age and composition from morainal clasts and U–Pb and Hf-isotopic analysis of detrital zircons in the Lambert Rift, and potential provenance of East Gondwanaland sediments

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**HEADINGS** and letter symbols **d+**, **c**, etc. remain in bold

*AUTHOR'S NOTE: <u>underline</u> = deleted* ***bold*** *= new material- all removed*
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## ABSTRACT

The Gamburtsev Subglacial Mountains (GSM) comprise a central terrane flanked by rifts. Their ages and composition are indicated by material shed downslope in the Lambert Rift during the Ediacaran, Permian–Triassic, and Cenozoic. Direct evidence is provided by morainal clasts of undated igneous/metamorphic rock and siltstone with *Glossopteris* that dates the rift system as Permian and contained detrital zircons that reflect the ≥300 Ma terrane; further evidence is provided by zircon-bearing detritus traced back to the upslope GSM from the ?600 Ma Sodruzhestvo Group, the Permian–Triassic Amery Group, and Cenozoic sediments in Prydz Bay.

The isotopic features of the detritus downslope from the GSM screened from those of exposed bedrock indicate a core with a zircon isotopic signature of paired U–Pb ages 575–500 Ma with *negative* εHf and 700–575 Ma with *positive* εHf, older ages of 890–700 Ma, ~970 Ma, 1050 Ma, 2100 Ma, 2450 Ma, 2750 Ma, and 3100 Ma; $T_{DMc}$ of 1.6–1.1 Ga and 2.5–2.1 Ga; and host rocks of granitoids and alkaline rocks.

The potential GSM provenance is connected with distant deposits by indicators of downslope (the cross-bed foreset dip azimuth in fluvial sediments, flute marks in turbidites), as in the central Transantarctic Mountains (TAM), Marie Byrd Land, Zealandia, Ellsworth-Whitmore Mountains, southern and SW Australia, Dronning Maud Land/South Africa, Lachlan and Thomson Orogens of eastern Australia, and the Mahanadi Rift of India.

The formative 530–500 Ma history of the GSM is modelled after (1) the coeval intra-continental Petermann Orogen of central Australia that shed sediment into bounding